REMARKS

Claims 1, 3-6, 8, 63-64, 67-71 and 74-76 were pending. Claims 3 and 75-76 have been cancelled. Claims 1, 63-64, 69-71 and 74 have been amended. New claims 77-89 have been added. Therefore, claims 1, 4-6, 8, 63-64, 67-71, 74 and 77-89 will be pending upon entry of the present amendment. No new matter has been added.

Support for the amendments to claims 1, 63-64 and 74 can be found, for example at page 8, line 13, page 14, lines 31-35 and page 21, line 25 of the specification as originally filed. Claims 69-71 were amended to correctly depend from independent claims 1 and 64 respectively. Support for the amendments to claims 70-71 can be found at least in the claims as originally filed. Support for new claims 77-89 can be found at least in the claims as originally filed, and at page 14, lines 31-35, page 16, lines 24-30, page 44, lines 33-37, page 45, lines 2-11 and at page 46, lines 17-19 of the specification as originally filed.

Rejection of Claims 3, 69-71, and 74 under 35 U.S.C. § 112, Second paragraph

Claims 3, 69-71 and 74 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite. The Examiner asserts that there is insufficient antecedent basis for the phrase "amphiphilic molecule" in claim 3. Claims 69-71 were rejected due to their dependency from claim 3. Claim 74 was rejected for lack of antecedent basis for the phrase "said protein's". The Examiner also asserts that the phrase "said two- or three-dimensional ordered array" is confusing.

Claim 3 has been canceled without prejudice thereby rendering moot the rejection. Claims 69-71 have been amended to correctly depend from independent claims 1 and 64 respectively. Claim 74 has been amended to recite "said water insoluble membrane proteins' structure" and "such that a two- or three- dimensional ordered array of said water insoluble membrane proteins is formed" thereby providing sufficient antecedent basis and clear claim wording.

In view of the above, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Rejection of Claims 1, 4, 5, 8, 67 and 74-75 under 35 U.S.C. § 102(b)

Claims 1, 4, 5, 8, 67 and 74-75 were rejected under 35 U.S.C. § 102(b) as being anticipated by Ribi (U.S. Patent No. 4,859,538). The Examiner asserts that Ribi teaches each and every element of the invention as claimed.

As described above, claims 1 and 74 have been amended to recite "water insoluble proteins ... without using a detergent or solubilizing agent ... laterally compressing by planar

membrane compression ... to an appropriate packing density ..." Claim 75 has been canceled without prejudice.

Ribi discloses methods for preparing articles for use in determination of protein structure, electronic devices, enzyme reactors and in biosensors. See Abstract. According to Ribi's methods, a protein layer ***must*** be specifically bound to a surfactant layer. See id. Ribi discloses adding protein to a preformed surfactant layer. See column 6, lines 37-50. Ribi discloses through out the application that his invention "requires a ***specific binding*** between the ligand bound to the surfactant and the protein." See, for example, column 4, lines 64-66. Furthermore, Ribi's specifically are directed to ***soluble proteins*** which are further solubilized using surfactants and other detergents.

Ribi fails to teach or suggest a method for forming a two- or three- dimensional ordered array of water ***insoluble*** membrane protein. Moreover, Ribi fails to teach or suggest methods without using a detergent or solubilizing agent because Ribi's method absolutely requires the specific binding between protein and surfactant which cannot occur in absence of either a detergent or solubilizing agent such as a surfactant. Furthermore Ribi fails to teach or suggest laterally compressing by planar membrane compression to an appropriate packing density as claimed. In fact, "planar membrane compression" and "packing density" are not important to Ribi because Ribi allows the protein-surfactant mixture to incubate at or below the maximum equilibrium spreading pressure and the formation of the resulting protein domain is controlled by the rate of adding the protein as well as the specific binding between protein and surfactant. See column 6, lines 37-39, and lines 57-60, and column 7, lines 22-28.

The Examiner's contention on page 6 of the Office Action that Ribi teaches that surfactants and polymers are not necessary to get ordered protein arrays is factually inaccurate because a "polymerizable surfactant" is not the same as a surfactant and polymer. See column 7, lines 43-45. Ribi's method may consider the polymerization step involving a polymerizable surfactant as optional but it still ***requires*** a surfactant for specific binding with the protein.

Moreover, the Examiner's assertion on page 6 of the Office Action that the pressure applied by Ribi is inherently above whatever critical density point is required for formation of a 2D or 3D ordered array is also factually inaccurate because the critical density point is an important factor in determining if the resulting ordered array will be two dimensional or three dimensional. See page 14, lines 27-33 of the specification as filed. Ribi fails to disclose a three dimensional ordered array. Ribi also fails to disclose the packing density or adjusting or controlling the packing density either above or below a critical density point to obtain the desired two or three dimensional array as claimed.

In view of the above, Applicant respectfully submits that independent claims 1 and 74 are patentable over Ribi. Claims 4, 5, 8 and 67 depend directly from independent claim 1 and are

therefore also patentable over Ribi. Reconsideration and withdrawal of the rejection is respectfully requested.

Rejection of Claims 1, 4, 5, 6, 8, 67 and 74-75 under 35 U.S.C. § 103(a)

Claims 1, 4, 5, 6, 8, 67 and 74-75 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Ribi in view of Ohlsson (Biochemistry and Bioenergetics (1995) vol. 38, pp. 137-148). The Examiner asserts that Ribi teaches each and every element of the claimed invention except use of proteoliposomes in his method. See page 6 of the Office Action. The Examiner further asserts that Ohlsson teaches that cholera toxin may be bound to proteoliposomes and concludes that it would be obvious to one skilled in the art at the time of invention to use the proteoliposomes taught by Ohlsson in the method taught by Ribi. Applicant respectfully traverses the rejection.

As discussed above, Ribi fails to teach each and every element of the invention as claimed. In particular, Ribi fails to teach or suggest a method of forming "three dimensional ordered array," "without using a detergent or solubilizing agent," "compressing by planar membrane compression," "to an appropriate packing density," and where "packing density is below a critical density point." Ohlsson fails to cure this deficiency because Ohlsson's methods are directed to fusion of liposomes and proteoliposomes onto solid substrates i.e. at the solid/liquid interface. See title and abstract. Nowhere does Ohlsson teach or suggest any methods to overcome the deficiencies of the primary reference. Morevover, Ohlsson fails to teach or suggest fusion of any types of proteins at the gas/liquid or gas/aqueous interface. Therefore, Ohlsson is irrelevant to one skilled in the art at the time of invention because there is no reasonable expectation that a method of fusing proteins at the solid/liquid interface will have any success at the gas/liquid or gas/aqueous interface due to lack of correlation between physical and chemical properties of proteins in different media.

In view of the above, Applicant respectfully submits that independent claims 1 and 74 are patentable over Ribi in view of Ohlsson. Claims 4, 5, 6, 8 and 67 depend directly from independent claim 1 and are therefore also patentable over Ribi in view of Ohlsson. Reconsideration and withdrawal of the rejection is respectfully requested.

Rejection of Claims 3, 63-64, 68-71, and 76 under 35 U.S.C. § 103(a)

Claims 3, 63-64, 68-71, and 76 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Ribi in view of Ohlsson and further in view of Bamdad (US 20050112607). The Examiner asserts that Ribi teaches each and every element of the claimed invention except use of proteoliposomes in his method. The Examiner further asserts that Ohlsson does not teach water insoluble membrane proteins. The Examiner states that Bamdad teaches water insoluble

membrane proteins and concludes that it would be obvious to one skilled in the art at the time of invention to use the water insoluble membrane proteins taught by Bamdad and proteoliposomes taught by Ohlsson in the method taught by Ribi. Applicant respectfully traverses the rejection.

As discussed above both Ribi and Ohlsson either alone or in combination, fail to teach or suggest each and every element of the claimed invention. Although Bamdad discloses water insoluble membrane proteins, Bamdad fails to cure the deficiency of Ribi and/or Ohlsson because Bamdad's methods produce monolayers on colloids that are stable in biologically relevant fluids i.e. at the solid-liquid interface. See paragraph [0034] of Bamdad. Therefore, Bamdad is also irrelevant to one skilled in the art at the time of invention because there is no reasonable expectation that a method applicable to assembling monolayers at the solid/liquid interface will have any success at the gas/liquid or gas/aqueous interface due to lack of correlation between physical and chemical properties of proteins in different media.

In view of the above, Applicant respectfully submits that independent claims 1 and 63-64 are patentable over Ribi in view of Ohlsson in further view of Bamdad. Claims 68-71 depend directly from independent claims 1 or 64 and are therefore also patentable over Ribi in view of Ohlsson in further view of Bamdad. Reconsideration and withdrawal of the rejection is respectfully requested.

CONCLUSION

The cancellation of and/or amendment to claims should in no way be construed as an acquiescence to any of the Examiner's objections and/or rejections. The cancellation of/amendments to the claims are being made solely to expedite prosecution of the above-identified application. Applicant reserves the option to further prosecute the same or similar claims in the present or another patent application. The cancellation of and/or amendments to claims herein are not related to any issues of patentability.

Because the time for taking action in the United States Patent and Trademark Office fell on a Saturday, i.e. August 29, 2009, this reply is being timely filed on the next succeeding business day per 37 C.F.R. § 1.7.

It is respectfully submitted that this application is in condition for allowance. If there are any remaining issues or the Examiner believes that a telephone conversation with Applicant's Attorney would be helpful in expediting prosecution of this application, the Examiner is invited to call the undersigned at (617) 227-7400.

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Respectfully submitted,

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